Ambient Air Monitoring - Lessons Learned from Katrina

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Katrina Air Monitoring Response Concerns

Debris Burning

Wildfires

Damaged Facilities

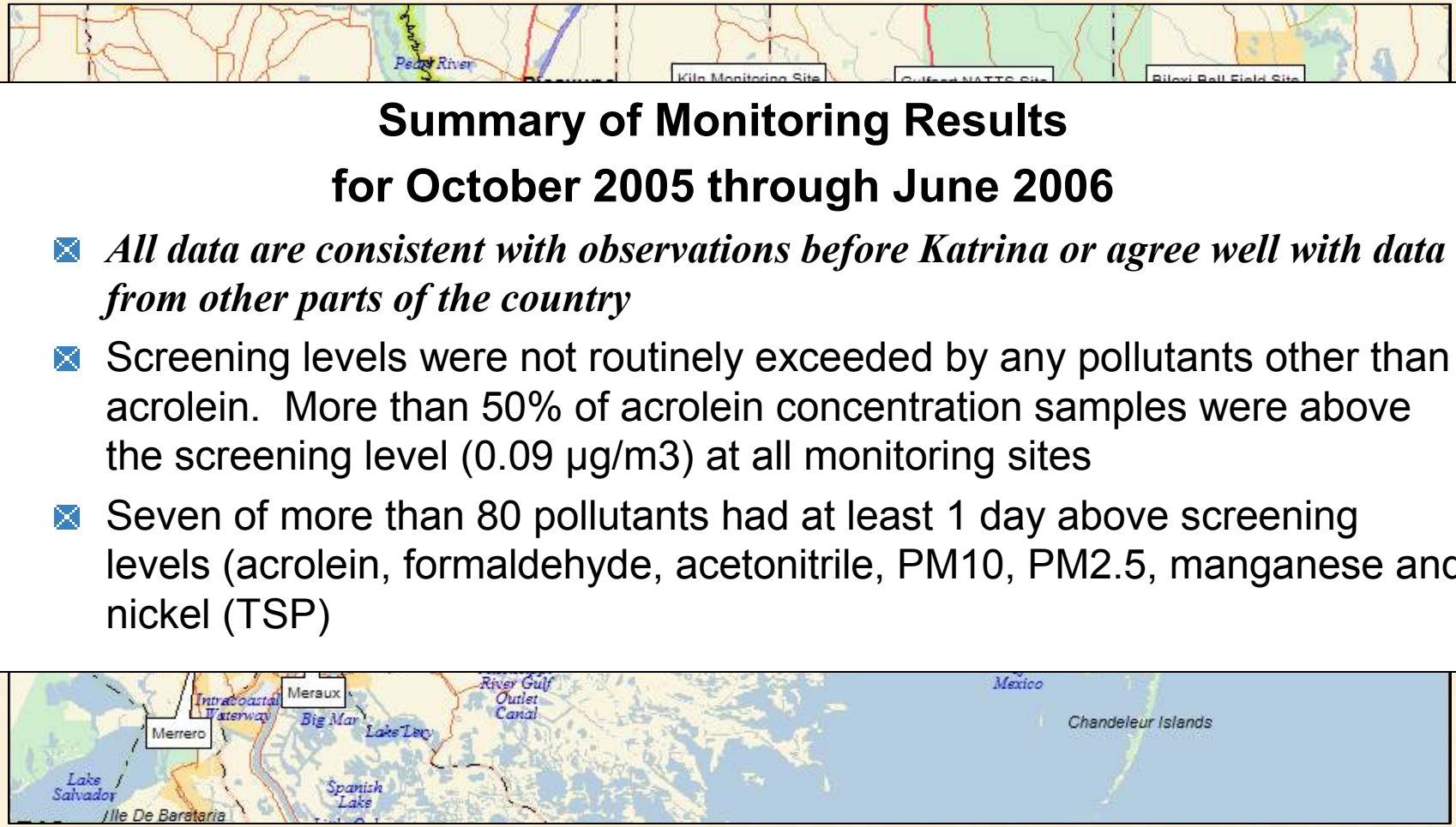
Heavy Diesel Equipment

Traffic Pattern Changes

Debris Removal

Katrina Ambient Air Monitoring Sites

Pollutants Monitored Include:
PM2.5, PM10, NATTS (Cr+6, carbonyls, VOC, SVOC), asbestos, and metals



Summary of Monitoring Results for October 2005 through June 2006

- ***All data are consistent with observations before Katrina or agree well with data from other parts of the country***
- Screening levels were not routinely exceeded by any pollutants other than acrolein. More than 50% of acrolein concentration samples were above the screening level (0.09 µg/m3) at all monitoring sites
- Seven of more than 80 pollutants had at least 1 day above screening levels (acrolein, formaldehyde, acetonitrile, PM10, PM2.5, manganese and nickel (TSP)

Waveland Mississippi Monitoring Site

Waveland Monitoring Site, Interior

From Monitoring Site to Junk in a Few Hours…

Damage Toll:

Monitoring Shelter
Ozone Monitor
NO-NO2-NOx Monitor
NOy Monitor
Gas Calibrator
Zero Air Generator
Computer and Telemetry
Refrigerator
UPS
Etc…

Total $80,000+

Emergency Action Planning

Lessons Learned

- "If you fail to plan … plan to fail."
- Take the lead. Don't wait for your director to make the decision.
- Move quickly and determined.
- Keep in touch with the other teams and make adjustments to the plan to accommodate problems.
- After the storm, conduct a site assessment.

Air Monitoring Challenges in Disaster Areas

- Understanding the management response structure;
- Developing ambient air monitoring plans;
- Coordinating efforts to locate, borrow, or purchase new sampling equipment;
- Adapting existing samplers to perform in an emergency scenario;
- Identifying new site locations;
- Assembling and installing equipment; and
- Identifying and funding lab analyses.

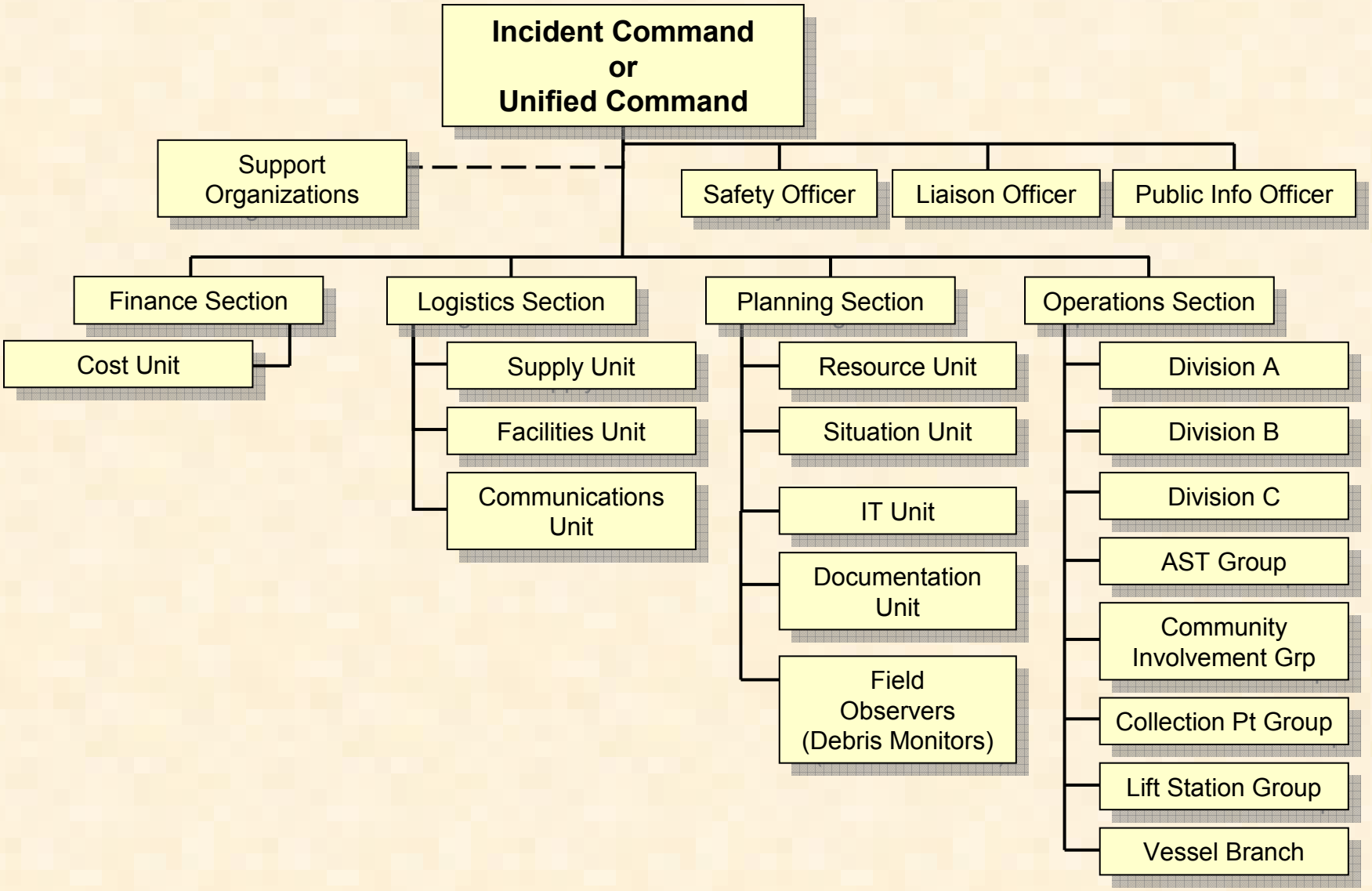
Understanding the Management Response Structure

EPA -

- follows the National Response Plan as co-lead with the Coast Guard for Emergency Support Functions (ESF) -10: Oil and Hazardous Materials;
- establishes Unified Command (ICS*)with other ESF-10 organizations (Federal/State/local);
- participates in Joint Field Offices which coordinate all ESF; and
- supports other ESF, especially ESF-3, Public Works and Engineering (USACE and FEMA co-leads)

*** The Incident Command System (ICS) has become standard procedure for all EPA responses—"routine" releases as well as natural disasters**

Incident Command Structure



Developing an Ambient Air Monitoring Plan

Ambient Air Monitoring Plan needs to answer the following questions:

- Why are you monitoring? What do you want to accomplish?
- What kind of method will give you the appropriate data?
- When will you should you begin monitoring?
- What are your priorities? What is most important?
- Do you have agreement across organizations?

An Ambient Air Monitoring Plan is needed for all data gathering initiatives.

Coordinating Efforts to Obtain Equipment

Establish teams

- Agency personnel
- Contractors
- Volunteers

Define roles and communications approach

Locate equipment

- Inventory on-hand
- Purchase
- Borrow

Identifying locations and types of equipment

Disaster conditions impacting monitors -

- No power
- Little security
- Limited access
- Spotty communications

Special needs under disaster conditions –

- Real-time data
- Remote access to telemetry
- Power source, A/C or battery
- Simple operation
- Mobility
- Expandability
- Appropriate accuracy level

Proximity to emission sources of concern

- Rapid Response—Wheels Up in Under 1 Hour
- Direct Integration into the Local Incident Commander
- Compatibility with Common Data Systems
- Remote Detection of Chemical Plumes
- Automated Data Processing and Transmission
- Aerial Photography Capability
- Radiological Detection Capability

Assembling and Adapting Equipment to Function in Disaster Area

Installing Equipment

Think SAFETY!!!

Expect no power.

Bring everything you will need such as tools, lumber, hardware, etc…

If you need tools, bring battery operated equipment.

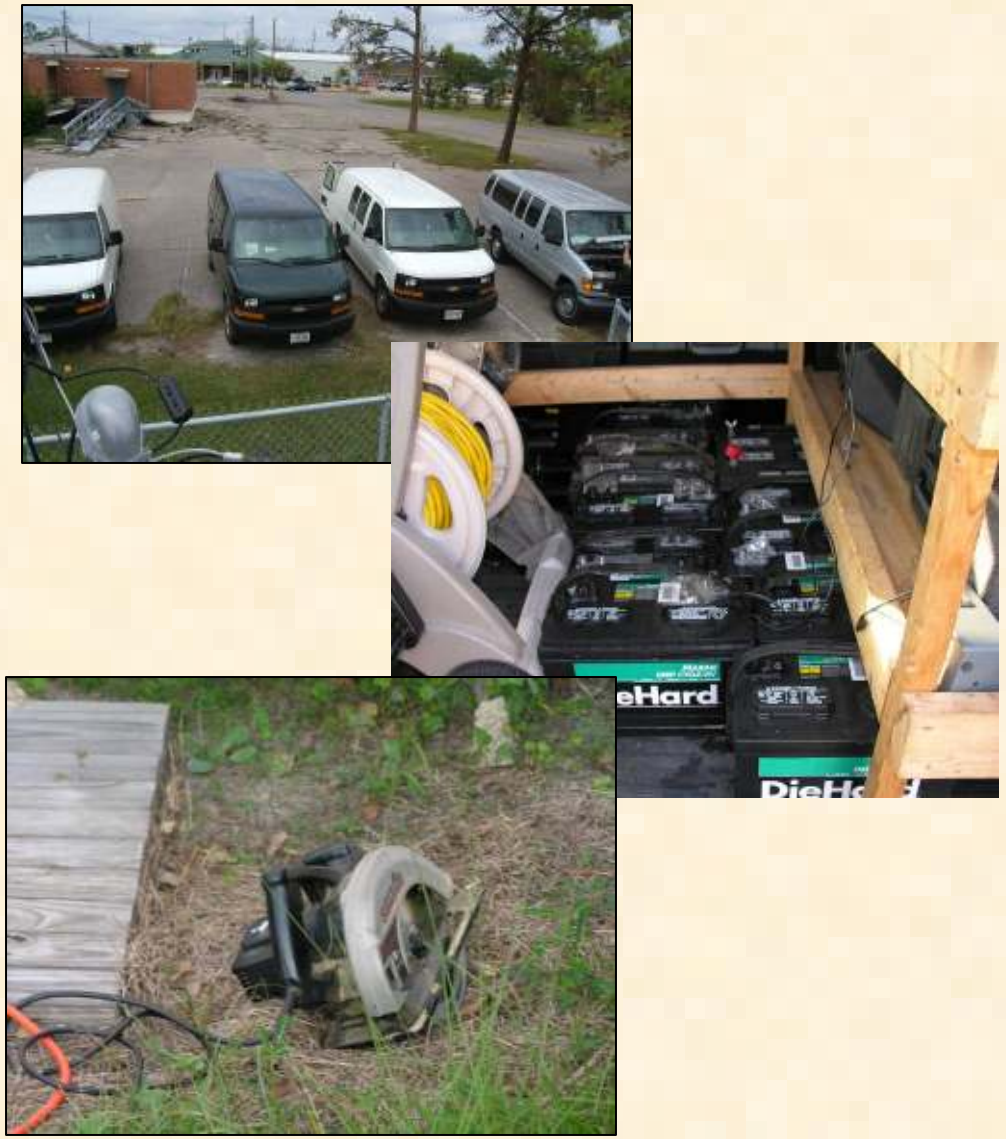
Expect to buy nothing. If you do need to make a purchase, expect a CASH ONLY situation.

Carry extra fuel.

Watch for areas with accessible power for charging equipment.

Use GPS mapping to navigate.

Think SAFETY!!!

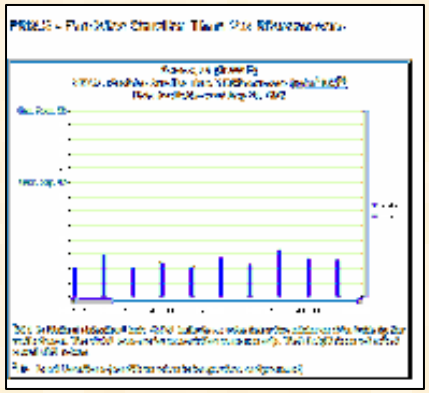


Identifying and Funding Laboratory Analyses

Mechanisms for Laboratory Analyses in Quick Response Situations -

- Monitoring plan objectives
- Existing in house facilities
- In house possibilities
- Existing contracts

Release and distribution of ambient data



Emergency Action Planning

Broward County, Hurricane Action Plan

Hindrances -

Storm path uncertainty

Storm strength uncertainty

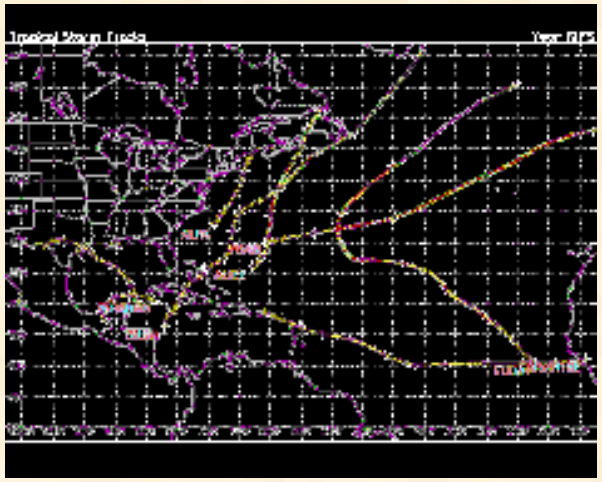
Data completeness, 75%

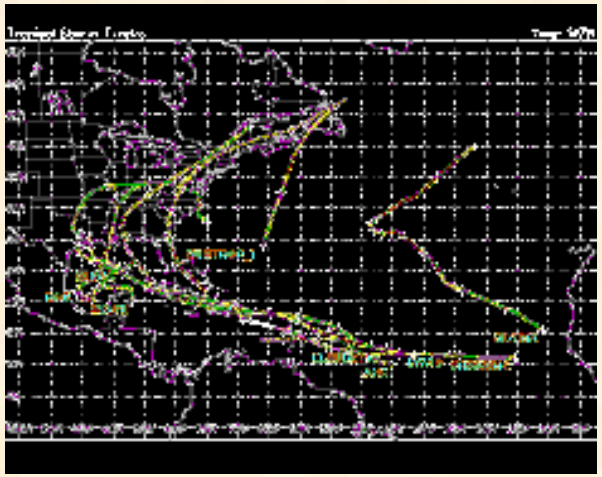
Who will make the decision?

How late can we wait?

When will it become too dangerous to act?

Staff's personal preparedness





Emergency Action Planning

Plan Development -

Evaluate sites for vulnerability and economic value;
Group sites by proximity;

Plan for 3 person teams – expect to have 2 person teams;

Arrange for communication – cell phones, radios, etc;

Plan vehicle assignments;

Pre-stage supplies and equipment;

Establish team routes moving from most vulnerable and most costly to the least vulnerable and least costly;

Be flexible - be prepared to by-pass sites that are inaccessible;

Review the plan annually in the spring and make necessary changes; and

Stress safety, above all else.

Emergency Action Planning

Implementation -

During Hurricane Watch, refuel all vehicles, charge phones or radios, and contact staff;

Release staff to make personal preparations; and

When the Hurricane Warning is announced, Make the Call.

Should teams meet prior, maybe when landfall is predicted within 5 days? Also, how can this be applied to other disaster situations?

Emergency Action Planning

Site Preparation

- Download data to site PC. Turn off data logger and PC. Turn off instruments.
- Turn off gas cylinders, remove regulators and cap.
- Disconnect power cords.
- Cover instruments with plastic sheeting.
- Crank down Met. towers.
- Move external equipment, PM2.5's, Air Tox canisters, PM10 inlets, etc. into shelters.
- Turn off the A.C. and the main power breaker.
- Consider removing instruments for vulnerable sites.

"Ounce of Medicine is worth a pound of prevention."

Ambient Air Monitoring Lessons Learned from Katrina

- **Heed Early Warnings and Develop Emergency Action Plans**
  - Saves money in replacing equipment
  - Shortens response time in re-establishing a monitoring network
- **Utilize Available Assistance On All Levels**
  - Agencies, regions, states, and locals must work together
  - Develop inventory of available assets
- **Develop an Ambient Air Monitoring Plan Template**
  - Readily available template is easier to update to specific situations
  - Quicker response allows for monitoring directly following and emergency
- **Research and Obtain Samplers for Emergency Response Use**
  - Research and find samplers that can meet emergency situation needs
  - If possible, use instruments that data can be remotely accessed
- **Use Existing Contract Resources**
  - Saves time in writing a new contract
  - Allows for quicker monitoring start-up
- **Learn from the Past**

  "Those who cannot learn from history are doomed to repeat it"

Applications Around the Country

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